SECTION 21

DECK JOINTS

1.21.1 FIXED AND EXPANSION

a. Transverse deck joints on most new bridge decks (i.e. joint movements up to approximately 100 millimeters) should consist of either preformed elastomeric compression seals or glandular type strip seals. The use of bolt down type strip seals shall be reviewed and approved on a project to project basis and is restricted to limited applications on rehabilitation projects involving deck joint reconstruction.

   Modular type deck joints are recommended for joint movements in excess of 100 millimeters. Currently no details exist for these types of deck joint systems. To protect the concrete slab, all deck joints shall have steel armoring on the edges. This shall include deck joints on bridges that are to be rehabilitated or reconstructed An exception to this is adjacent prestressed concrete slab and box beams with span lengths less than 17 meters.

b. Typical details for steel armored compression seal joints are shown on Guide Sheets Plates 3.8-3 through 3.8-15 and on Bridge Construction Detail (BCD 2). The details shown on these guide sheets are for typical installations on "new" construction or deck slab replacement projects. However, the basic concepts can be applied to a joint rehabilitation project if modifications are made to the depth of the steel rail section, the stud arrangement and the connection details.

c. The chart shown on Guide Sheet Plate 3.8-3 shall only be used as a guide in the size selection of preformed elastomeric compression seals. Compression seals smaller than 64 millimeters are generally recommended only for fixed end joints. For skewed structures, seals shall be sized such that movements parallel to the joint caused by racking are not greater than 15% of the nominal compression seal width. This is a conservative value utilized by many seal manufacturers.

d. Payment for structural steel shapes and plates used for bridge deck compression seal joints shall be scheduled for payment under a separate lump sum item "Structural Steel Deck Joints". However, the weight shall be calculated and noted on the plans.

   Payment for structural steel rails, shapes, plates, etc., used in strip seal expansion dams and modular bridge deck joints shall be included in the linear meter price bid for these items.

e. See Guide Sheet Plates 3.10-1, 3.10-2, 3.10-4, 3.10-5 and 3.10-6 for deck joint details used with prestressed concrete beams.

1.21.2 LONGITUDINAL

a. Longitudinal construction joints shall only be provided where necessary for stage construction and for compatibility with the deck slab pouring sequence on wide structures with many lanes. Longitudinal construction joints, if necessary, shall

be located over a stringer.

Reference Guide Sheet Plates 3.8-1 and 3.8-2 for details concerning longitudinal construction joints in deck slabs.

b. Longitudinal expansion joints shall only be provided where necessary to accommodate transverse expansion on wide structures (i.e., generally for superstructures wider than 27 meters) and between parallel bridges. The joint shall preferably be located beneath the median barrier.

Reference Guide Sheet Plates 3.8-1 and 3.8-2 for details concerning longitudinal expansion joints in deck slabs.

1.21.3 STRIP SEAL EXPANSION DAMS

a. Strip seal expansion dams shall consist of a molded neoprene rubber gland locked in the cavities of two parallel steel rail sections. The steel rail material shall conform to AASHTO M 270/M 270 M Grade 250 or AASHTO M 270/M270 M Grade 345W. The entire joint system shall be hot dipped galvanized after fabrication.

Any galvanized coating of the deck joint system which is damaged during field welding or from other causes shall be repaired by methods outlined in ASTM A780. Unless specified, the galvanized surface should not be painted. If painting is required, refer to 503.15 D. of the NJDOT Standard Specifications for Road and Bridge Construction for guidance in repairing the damaged area. The damaged area shall be repaired prior to installing the neoprene gland. The neoprene gland shall be continuous for the full bridge width including sidewalks, parapets and median barriers.

b. Strip seal expansion dams may be used when the following conditions exist or, as approved by the Engineer, on a project to project basis:

1.) When the length contributing to expansion is less than 20 meters, and the skew is greater than 35 degrees.

2.) When the length contributing to expansion is greater than or equal to 20 meters and less than or equal to 75 meters, and the skew is greater than 25 degrees.

3.) In the area outside of the 102 millimeter wide sealer limit on skews less than or equal to 25 degrees as shown on Guide Sheet Plate 3.8-3.

Special consideration shall be given when the length contributing to expansion is greater than 75 meters.

c. When a transverse strip seal intersects with a longitudinal compression seal, the joint subjected to the larger movement shall remain continuous and the other seal shall butt up against it. When longitudinal and transverse strip seals intersect, various factory molded intersections are available as needed. It is

recommended that strip seal manufacturers be contacted in order that the most effective details can be specified for these situations.

d. It is essential to the operation of the strip seal that no form of hot or cold applied joint filler be placed over the top of the rubber gland. All sidewalk joints must have steel cover plates. Joints in parapets and median barriers should preferably, if possible, be designed without steel cover plates. In these cases the steel rail sections shall be angled up into the parapet or median barrier and the concrete tapered to the edge of the rail as required.

   When approved, steel cover plates may be used if required on highly skewed structures or for specific project requirements.

e. The maximum allowable joint width measured normal to the steel rail sections shall be 100 millimeters, with 75 millimeters preferred. The minimum joint widths shown on the construction plans for the superstructure shall be set at 21 EC. They shall be set, based upon the project requirements and the minimum installation width of the seal, normal to the steel rail sections

   The minimum joint installation width is generally equal to 38 millimeters for smaller size strip seals.

f. The designer should closely analyze and provide details and configurations in problematic areas; such as, sidewalks and parapets. The potential for joint leakage is usually greater in these areas, and they are often difficult to construct and maintain.

   Joint details at sidewalks, parapets and median barriers shall be shown on the plans.

g. The joint anchorage into the deck should be designed with a factor of safety of at least 2.0. To assure that this element of the joint will not fail, the factor of safety should be applied to all known loads